AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

LISTING OF CLAIMS:

Claim 1. (Previously presented) A recombinant microorganism whose gene expression of squalene synthase is reduced compared to a host microorganism, thereby is capable of producing carotenoids in an enhanced level relative to the host microorganism, characterized in that it contains an antisense polynucleotide against a nucleic acid molecule selected from the group consisting of:

(a) nucleic acid molecules encoding the polypeptide in SEQ ID NO:3;

(b) nucleic acid molecules comprising the sequence in SEQ ID NO:2;

(c) nucleic acid molecules whose nucleotide sequence is degenerate as a result of the genetic code to a nucleotide sequence of (a) or (b);

(e) nucleic acid molecules encoding a polypeptide derived from the polypeptide whose sequence has an identity of 51.3 % or more to the amino acid sequence of the polypeptide encoded by a nucleic acid molecule of (a) or (b);

(g) nucleic acid molecules-comprising a polynucleotide having a sequence of a nucleic acid molecule amplified from a Phaffia nucleic acid library using the primers depicted in SEQ ID NO:4, 5, and 6;

(j) nucleic acid molecules encoding a polypeptide having squalene synthase activity, wherein said polypeptide is recognized by antibodies that have been raised against a polypeptide encoded by a nucleic acid molecule of any one of (a), (b), (c) and (g);

(k) nucleic acid molecules obtainable by screening an appropriate library under high stringency conditions with a probe having the sequence of the nucleic acid molecule of any one of (a), (b), (c), (e), (g) and (j), and encoding a polypeptide having squalene synthase activity, wherein the high stringency conditions include hybridizing in 6xSSC, 0.5% SDS, 100 μg/ml denatured salmon sperm DNA, 50% formamide overnight at 42° C and washing once in 2xSSC, 0.5% SDS at room temperature for 15 minutes followed by a second wash in 0.1xSSC, 0.5% SDS at room temperature for 15 minutes.

Claim 2. (Previously presented) A recombinant microorganism whose gene expression of squalene synthase is reduced compared to a host microorganism, thereby is capable of producing carotenoids in an enhanced level relative to the host microorganism, characterized in that it contains an antisense polynucleotide against a nucleic acid molecule selected from the group consisting of:

(m) nucleic acid molecules comprising the nucleotide sequence as depicted in SEQ ID NO:1;

(n) nucleic acid molecules whose nucleotide sequence is degenerate as a result of the genetic code to a nucleotide sequence of (m);

(p) nucleic acid molecules encoding a polypeptide derived from the polypeptide whose sequence has an identity of 51.3 % or more to the amino acid sequence of the polypeptide encoded by a nucleic acid molecule of (m);

(q) nucleic acid molecules comprising a fragment encoded by a nucleic acid molecule of any one of (m), (n) or (p) and having squalene synthase activity;

(r) nucleic acid molecules comprising a polynucleotide having a sequence of a nucleic acid molecule amplified from a Phaffia nucleic acid library using the primers depicted in SEQ ID NO:4, 5, and 6;

(s) nucleic acid molecules encoding a polypeptide having squalene synthase activity, wherein said polypeptide is a fragment of a polypeptide encoded by any one of (m), (n), (p), (q) and (r);

(t) nucleic acid molecules comprising at least 15 nucleotides of a polynucleotide of (m);

(u) nucleic acid molecules encoding a polypeptide having squalene synthase activity, wherein said polypeptide is recognized by antibodies that have been raised against a polypeptide encoded by a nucleic acid molecule of any one of (m), (n), (p), (q), (r) and (s);

(v) nucleic acid molecules obtainable by screening an appropriate library under high stringency conditions with a probe having the sequence of the nucleic acid molecule of any one of (m), (n), (p), (q), (r), (s), (t) and (u), and encoding a polypeptide having squalene synthase activity, wherein the high stringency conditions include hybridizing in 6xSSC, 0.5% SDS, 100 μg/ml denatured salmon sperm DNA, 50% formamide overnight at 42° C and washing once in 2xSSC, 0.5% SDS at room temperature for 15 minutes followed by a second wash in 0.1xSSC, 0.5% SDS at room temperature for 15 minutes;

(w) nucleic acid molecules whose complementary strand hybridizes under high stringency conditions with a nucleic acid molecule of any one of (m), (n), (p), (l), (r), (s), (t), (u), (v), and encoding a polypeptide having squalene synthase activity,

wherein the high stringency conditions include hybridizing in 6xSSC, 0.5% SDS, 100 μg/ml denatured salmon sperm DNA, 50% formamide overnight at 42° C and washing once in 2xSSC, 0.5% SDS at room temperature for 15 minutes followed by a second wash in 0.1xSSC, 0.5% SDS at room temperature for 15 minutes.

Claim 3. (Previously presented) The recombinant microorganism of claim 1, wherein said polynucleotide encodes an amino acid sequence which is identified by SEQ ID NO:3 or has an identity of 51.3 % or more with SEQ ID NO:3.

Claim 4. (Previously presented) The recombinant microorganism of claim 1, wherein said polynucleotide is isolated from a strain of Phaffia rhodozyma or Xanthophylomyces dendrorhous.

Claim 5. (Previously presented) A method for making a recombinant vector comprising inserting the polynucleotide of claim 1 into a vector.

Claim 6. (Previously presented) A recombinant vector containing the polynucleotide of claim 1.

Claim 7. (Previously presented) The vector of claim 6 in which the polynucleotide is operatively linked to expression control sequences allowing expression in prokaryotic or eukaryotic cells.

Claim 8. (Previously presented) A method of making a recombinant microorganism comprising introducing the vector of claim 6 into the host microorganism.

Claim 9. (Previously presented) The method of claim 8, wherein said host microorganism is selected from *E. coli* or *S. cerevisiae*.

Claim 10. (Previously presented) A recombinant microorganism containing the vector of claim 6.

Claim 11. (Previously presented) A process for producing a polypeptide having squalene synthase activity comprising culturing the recombinant microorganism of claim 10 and recovering the polypeptide from the culture of said recombinant microorganism.

Claims 12-26 (Cancelled).

Claim 27. (Currently amended) An isolated polynucleotide sequence selected from the group consisting of a polynucleotide that encodes the polypeptide sequence of SEQ ID NO: 3, a polynucleotide that comprises the sequence of SEQ ID NO: 2, and polynucleotide sequences that are at least 95% ~~90%~~ identical to the sequence of SEQ ID NO: 2~~, and polynucleotides that hybridize under high stringency conditions to SEQ ID NO: 2 and that have SQS activity, wherein the high stringency conditions comprise hybridizing in 6xSSC, 0.5% SDS, 100 µg/ml denatured salmon sperm DNA, 50% formamide overnight at 42° C and washing once in 2xSSC, 0.5% SDS at room temperature for 15 minutes followed by a second wash in 0.1xSSC, 0.5% SDS at room temperature for 15 minutes~~.

Claim 28. (Previously presented) The isolated polynucleotide of claim 27, wherein the polynucleotide encodes the polypeptide of SEQ ID NO: 3.

Claim 29. (Previously presented) The isolated polynucleotide of claim 27, wherein the polynucleotide is SEQ ID NO: 2.

Claim 30. (Previously presented) The isolated polynucleotide of claim 27, wherein the polynucleotide is at least 95% identical to SEQ ID NO: 2.

Claim 31. (Cancelled).

Claim 32. (Previously presented) An isolated polynucleotide that is complementary to a polynucleotide sequence that is selected from the group consisting of a polynucleotide that encodes the polypeptide sequence of SEQ ID NO: 3, a polynucleotide that comprises the sequence of SEQ ID NO: 2, polynucleotide sequences that are at least 90% identical to the sequence of SEQ ID NO: 2, and polynucleotides that hybridize under high stringency conditions to SEQ ID NO: 2 and that have SQS activity, wherein the high stringency conditions comprise hybridizing in 6xSSC, 0.5% SDS, 100 μg/ml denatured salmon sperm DNA, 50% formamide overnight at 42° C and washing once in 2xSSC, 0.5% SDS at room temperature for 15 minutes followed by a second wash in 0.1xSSC, 0.5% SDS at room temperature for 15 minutes.

Claim 33. (Previously presented) The isolated polynucleotide of claim 27, wherein said polynucleotide is isolated from a strain of Phaffia rhodozyma or Xanthophylomyces dendrorhous.

Claim 34. (Previously presented) A method for making a recombinant vector comprising inserting the polynucleotide of claim 27 into a vector.

Claim 35. (Previously presented) A recombinant vector containing the polynucleotide of claim 27.

Claim 36. (Previously presented) The vector of claim 35 in which the polynucleotide is operatively linked to expression control sequences allowing expression in prokaryotic or eukaryotic cells.

Claim 37. (Previously presented) A method of making a recombinant microorganism comprising introducing the vector of claim 35 into a host microorganism.

Claim 38. (Previously presented) The method of claim 37, wherein said host microorganism is selected from *E. coli* or *S. cerevisiae*.

Claim 39. (Previously presented) A recombinant microorganism containing the vector of claim 35.

Claim 40. (Previously presented) A process for producing a polypeptide having squalene synthase activity comprising culturing the recombinant microorganism of claim 39 and recovering the polypeptide from the culture of the recombinant microorganism.